

Attorney Docket No. 101792-300

U.S. Serial No. 09/120,664

Page 5 of 8

REMARKS

By virtue of this Amendment, claim 38 is amended to add the limitation that the size for the composite particles range from 1 to 20 microns in diameter. Support for this amendment may be found at page 7, lines 21 and 22 of the originally filed application.

Claim 50 is newly added. Support for claim 50 may be found at examples 19 and 21. (See Table 2 at page 20 of the original specification)

No claims are cancelled. Accordingly, claims 1, 38, 40-42, 46 and 50 are presented for further examination. Applicants submit no new matter has been added.

Rejections under 35 USC §102

Claims 1, 38, 40-42 and 46 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,916,947 to Morris, et al.

Morris, et al. discloses a particle mixture in powder or slurry form comprising zinc oxide and a photosensitizer, wherein zinc oxide is in photoelectric proximity to the photosensitizer. (Col. 2, lines 42-52). The photosensitizer could be zinc pyrithione (hereafter ZPT). Morris et al. discloses further in the claim 15 that the photosensitizer is surface coated onto zinc oxide by mixing the photosensitizer and zinc oxide in solution.

The phrase "surface coated" is not specifically defined in Morris, et al. However, Morris et al. discloses in claim 1, from which claim 15 depends, that zinc oxide has a mean particle size of between 0.1 to 0.5 microns and a surface area of between 1-10 square meters per gram. In addition, Morris et al. discloses further that only less than one part of zinc pyrithione is used for every four parts of zinc oxide. Moreover, when zinc pyrithione and zinc oxide with the disclosed features are mixed together in the disclosed ratio according to Morris et al., there will not be any composite particles formed having a core consisting of zinc oxide and a shell consisting of zinc pyrithione formed by the transchelation reaction of a water-soluble salt of pyrithione with a portion of the core as recited in the instant claims. Since there is a "common ion" in both compounds, namely zinc ion, there is no difference in stability constant attributable to a

Attorney Docket No. 101792-300

U.S. Serial No. 09/120,664

Page 6 of 8

transchelation reaction. Therefore, no reaction will occur between the two zinc compounds disclosed in Morris et al. Rather, the product made by the method disclosed in Morris et al. is apparently a physical mixture of zinc oxide and zinc pyrithione being in close contact with each other. If there were any coated particles in the mixture produced from the Morris' procedure at all, they would be particles of zinc pyrithione partially coated with zinc oxide, not the other way around, especially because in the "coating" method disclosed by Morris et al., the size of the zinc oxide used is very small, the surface area of the zinc oxide is large and the amount of zinc oxide used is in a large excess compared to zinc pyrithione. Accordingly, the only plausible conclusion is that by referring to "surface coated", Morris et al. means physical attachment, not chemical bonding.

This interpretation is consistent with the teachings of Morris et al. as a whole. Morris et al. discloses that it is known that hydrogen oxide is a toxicant and can be formed by in situ reduction of oxygen on zinc oxide under ultraviolet light of wavelengths greater than 400 nm. See column 1, lines 62-67 and column 2, lines 1-3. Morris et al. discloses further that zinc oxide pigments of high purity reflect visible light and absorb no photoenergy at wavelengths above about 350 nm, thus has been thought to be ineffective for producing phototoxic surface. See column 3, lines 20, 21 and column 1, lines 65-68 and column 2, lines 1 and 2. However, Morris et al. found that the energy from visible light can be absorbed by contacting the surface of the zinc oxide with one or more photosensitizer, thus effectively generating hydrogen peroxide. See column 3, lines 22-25. Morris et al. discloses that the suitability of photosensitizer is determined by contacting the material with zinc oxide and measuring the concentration of peroxide generated. Moreover, in the summary portion of the specification, Morris et al. discloses that in the particle mixture, zinc oxide is in photoelectric proximity to a photosensitizer. Accordingly, Morris et al. discloses a mixture of zinc oxide and a photosensitizer, where the zinc oxide is surface attached to the photosensitizer.

In contrast, the present invention claims a biocidal composition comprising composite particles. The composite particles contain a shell and a core. The core of the present invention consists essentially of a metal or metal-containing compound. The shell of the present invention

Attorney Docket No. 101792-300

U.S. Serial No. 09/120,664

Page 7 of 8

contains a metal pyrithione that is formed by a chemical reaction of a water-soluble pyrithione and a portion of the metal or metal-containing compound of the core.

Applicants respectfully submit that the Morris et al. product is structurally different from the instantly claimed product. Specifically, since the zinc pyrithione photosensitizer cannot transchelate with the zinc oxide, there can be no reaction at the interface of those two compounds in view of the common zinc ion present in both. Further, the common zinc ion used in both the zinc oxide and zinc pyrithione of Morris et al. militates against such composite particle formation, for the reasons given above. Accordingly, the product prepared by the process disclosed by Morris et al. is a mixture of two discrete particles that are held together through physical forces.

On the other hand, the composite particles recited in the instant claims contain a shell and a core, wherein the shell is formed by a transchelation reaction of a water-soluble salt of pyrithione with a portion of the core. In another words, the composite particles according to the claimed invention contain a core and shell wherein at the interface of the core and shell, there is a chemical bonding. Applicants submit that Morris et al. provides no suggestion or teaching in favor of such a composite particle. Accordingly, the Morris et al. product itself is different from, and not suggestive of, the instantly claimed composition. Therefore, Applicants submit that the instant rejection of the claims under 35 U.S.C. §102(e) is untenable and should be withdrawn.

Moreover, the composite particles contained in the biocidal composition of instant claim 38 have a size ranging from 1 to 20 microns in diameter. Morris et al. does not disclose or suggest any composite particles, much less a composite particle having a size as recited in instant claim 38.

In addition, claim 50 is directed to a biocidal composition comprising composite particles, each of the composite particles containing a shell and a core, where the core consists of zinc or zinc selenide and the core consists of zinc pyrithione. Applicants respectfully submit that Morris et al. does not disclose or suggest any mixture containing zinc pyrithione and zinc or zinc selenide, much less a composite particle having a core of zinc or zinc selenide and a shell of zinc pyrithione formed by a transchelation reaction of a water-soluble salt of pyrithione selected from

Attorney Docket No. 101792-300

U.S. Serial No. 09/120,664

Page 8 of 8

the group consisting of sodium pyrithione and potassium pyrithione with a portion of the zinc or zinc selenide of the core

In view of the above, it is believed that the instant claims are in condition for allowance. Therefore, Applicants respectfully request consideration of the amended claims, and an early receipt of a Notice of Allowance of the claims as amended.

Any fees due with this Reply may be charged to Deposit Account 23-1665 under Customer Number 27267.

Respectfully submitted,
David Gavin et al.

Date: March 16, 2009



Wanli Wu
Reg. No. 59,045

CONTACT INFORMATION:
WIGGIN & DANA LLP
One Century Tower
New Haven, CT 06508-1832
Telephone: (203) 498-4317
Facsimile: (203) 782-2889
Email: wwu@wiggin.com

12800\601\2184618.1